IN THE CLAIMS

Please substitute the following amended claim(s) for corresponding claim(s) previously presented. A copy of the amended claim(s) showing current revisions is attached.

Cancel claim 2 without prejudice.

1. (Amended) A synchronous machine comprising:

a rotor coupled to a rotor cooling system, wherein said rotor is cooled by a rotor cooling fluid passing through said rotor;

a stator around the rotor and separated from the rotor by an annular gap between the rotor and an inner surface of the stator, and

a stator ventilation system wherein the stator ventilation system injects a cooling gas into the stator, and said cooling gas flows through the stator and exits the stator at the annular gap and wherein said rotor being impervious to said cooling gas.

3. (Amended) A synchronous machine as in claim 1 wherein the cooling gas flows through stator gas passages.

4. (Amended) A synchronous machine as in claim 1 wherein said ventilation system further comprises a heat exchanger mounted on said machine radially outward of said stator.

5. (Amended) A synchronous machine as in claim 1 wherein said rotor comprises a superconducting coil, and said rotor cooling system provides the rotor cooling fluid as a cryogenic cooling fluid to said coil.

9. (Amended) A synchronous machine as in claim 1 wherein said ventilation system is a closed-loop system in which a cooling gas circulates through the stator and a heat exchanger in a flow path of the gas.

10. (Amended) A synchronous machine as in claim 1 wherein said ventilation system is an open-loop system in which a cooling gas passes through the stator and the air gap, and exhausts to an environment outside of the machine.

11. (Amended) A superconducting electromagnetic machine comprising:

a solid core rotor having a cryogenically cooled superconducting rotor coil winding;

a stator coaxial with said rotor and having stator coils magnetically coupled with said superconducting rotor coil winding, said stator coils arranged around said rotor, and said stator having cooling passages extending from an outer periphery of the stator to an inner periphery of the stator, said inner periphery separated from the rotor by an annular air gap;

said rotor having cooling passages for a cryogenic cooling fluid;

an annular air gap between said solid core rotor and said stator, wherein said annular gap having at least one lateral opening comprising a cooling gas passage port and said annular gap being substantially open along a length of said rotor;

a stator ventilation system providing a cooling gas to said outer periphery of the stator and said passages of the stator, wherein said cooling gas flows through said annular gap and through said cooling gas passage port.

12. (Amended) A superconducting electromagnetic machine as in claim 11 wherein the cooling gas exits the stator at said cooling gas passage port open to the annular air gap.

13. (Amended) A superconducting electromagnetic machine as in claim 11 wherein said ventilation system further comprises a heat exchanger.

18. (Amended) A superconducting electromagnetic machine as in claim 11 wherein said ventilation system is a closed-loop system in which a cooling gas circulates through the stator and a heat exchanger in a flow path of the gas.

20. (Amended) A method for cooling a superconducting electromagnetic machine having a solid core rotor including a superconducting rotor coil winding and a stator and a stator ventilation system, said method comprising the steps of:

a. cryogenically cooling the rotor coil winding;

b. cooling the stator with a cooling gas flowing through the stator, and

c. drawing the cooling gas out of the stator into a air gap between the stator and the rotor core, wherein the cooling gas flows through the air gap without flowing through the rotor core.

21. (Amended) A method for cooling as in claim 20 wherein the cooling gas flows into an outer periphery of the stator, through stator cooling gas passages and out into the air gap.

23. (Amended) A method for cooling as in claim 20 wherein said cooling gas is drawn by a fan out of the air gap and is directed to a heat exchanger, and said method

further comprises extracting heat from the cooling gas by the heat exchanger, and circulating the cooling gas through the stator and the heat exchanger.

REMARKS

The drawings and claims have been amended as suggested in the Action to overcome the objection and rejections as to their form. The 52-word abstract has not been change because it already fully complies with PTO requirements.

The rejection of claim 1 as being anticipated by Curtis et al (U.S. Patent 3,735,502) is moot in view of the amendments made to incorporate the limitations of claim 2 into claim 1. Claim 2 was not rejected based on Curtis. Accordingly, Curtis does not anticipate claim 1 which has been amended to include the limitation of former claim 2 regarding cooling gas passing through the air gap.

The rejection of claims 1-3, 5-7, 11, 12, 14-16, 19 and 20 as being anticipated by Karhan et al (U.S. Patent 4,352,034) is traversed. These claims define a stator cooling system which draws a cooling gas through the stator-rotor air gap and through cooling passages in the stator, without passing the cooling gas through the rotor.

Karhan et al teaches away from circulating stator only cooling gas through the air gap by stating that cooling gas passing through the air gap is desirable only when the cooling gas also passes through the rotor. Karhan discloses a stator cooling system in which baffles (11) to block cooling gases from the air gap when the gas does not also flow through the rotor. In particular, Karhan teaches: